TMX LT02

SAW Filter datasheet

1.4 x 1.1 mm, SMD

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Issue: Rev 2, 9 January 2023

TMX LT02

SAW Bandpass Filters | Wireless Communications

Features

Features

- 915 MHz center frequency
- Ceramic package for Surface Mounted Technology
- Low Loss: 2.7 dB typical value within PassBand Width 902 to 928 MHz
- No matching network required for operation at 50 Ω
- Unbalanced to unbalanced operation

Applications

- Remote control - RF
- Wireless applications:
  - Home appliances
  - Security systems
  - Smart metering

1.4 x 1.1 mm

Maximum Ratings

Parameter	Min.	Typ.	Max.	Unit
Storage temperature range (T_{stg})	-40		85	°C
Operating temperature range (T_A)	-40		85	°C
DC voltage between any Terminals (V_{DC})			5	V
Maximum input power handling (at 25°C during 50,000)			20	dBm
Maximum pulse input power (4s max with 1 pulse every 30 mn max)			24	

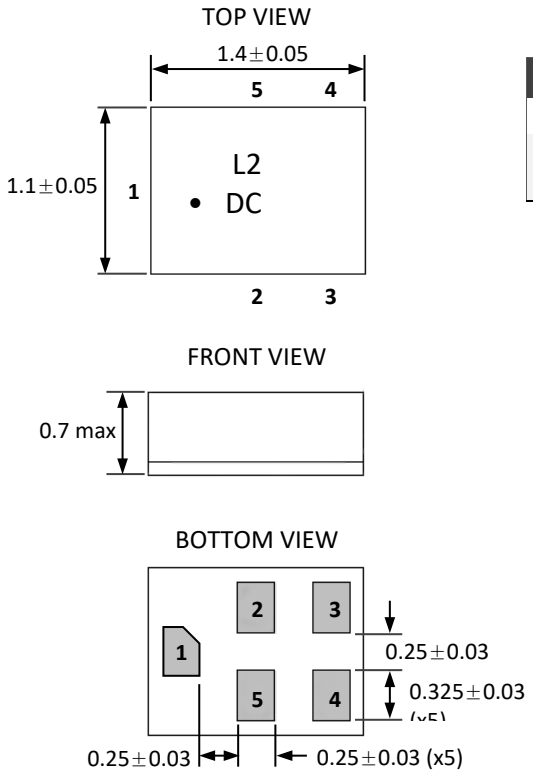
Frequency and Electrical Characteristics (Reference temperature @ 25°C)

Parameter	Min.	Typ.[1]	Max.	Unit
Center frequency (f_C)		915.0		MHz
Bandwidth (BW, passband width)	26.00			MHz
Maximum Insertion loss (IL, 902 – 928 MHz)		2.7	3.2	dB
Amplitude ripple (902 – 928 MHz)		0.9	1.8	dB
Absolute Attenuation				dB
From 10.00 to 845.00 MHz	39	42		
From 845.00 to 880.00 MHz	35	38		
From 947.00 to 970.00 MHz	13	30		
From 970.00 to 1020.00 MHz	33	45		
From 1020.00 to 1200.00 MHz	35	45		
Input impedance[2] (Single ended)		50		Ω
Output impedance[2] (Single ended)		50		Ω

[1] Typical values are nominal performances at room temperature

[2] No external matching is required

Model Outline, Pin Connection and Marking



Marking		Note
Line 1	L2	RakonXpress designation (TMX LT02)
Line 2	• DC	• = Identify black dot DC = Date code (See the tables below)

Pin	Connections
1	Input unbalanced
4	Output unbalanced
2, 3, 5	To Be Grounded

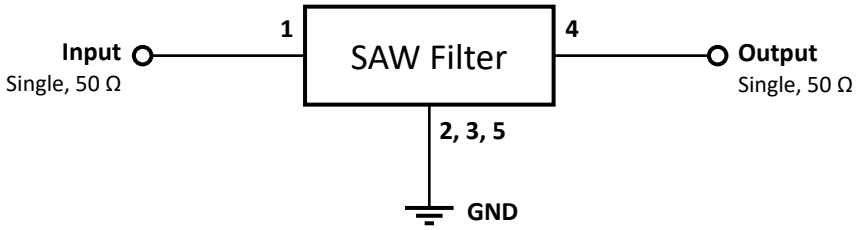
Unit: mm

Date code (1st digit)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	NovV	Ded
2020 & 2024	n	p	q	r	s	t	u	v	w	x	y	z
2021 & 2025	A	B	C	D	E	F	G	H	I	K	L	M
2022 & 2026	N	P	Q	R	S	T	U	V	W	X	Y	Z
2023 & 2027	a	b	c	d	e	f	g	h	i	j	k	m

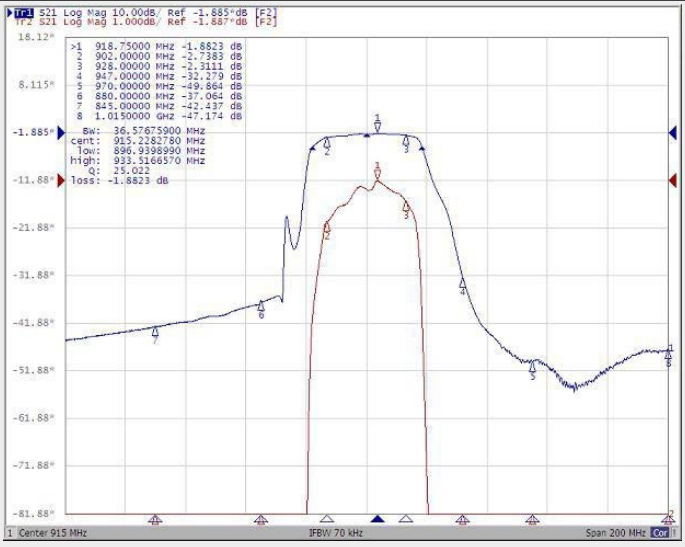
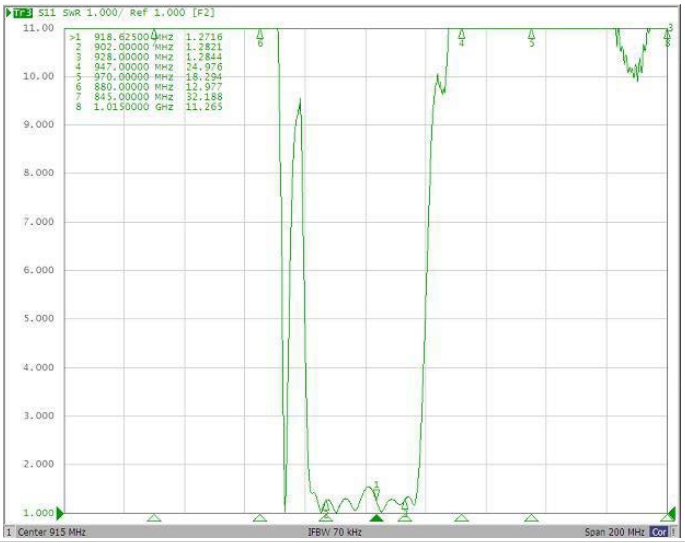
Date code (2nd digit)														
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th
R	S	T	U	V	W	X	Y	Z	a	b	d	e	f	g

Test Circuit

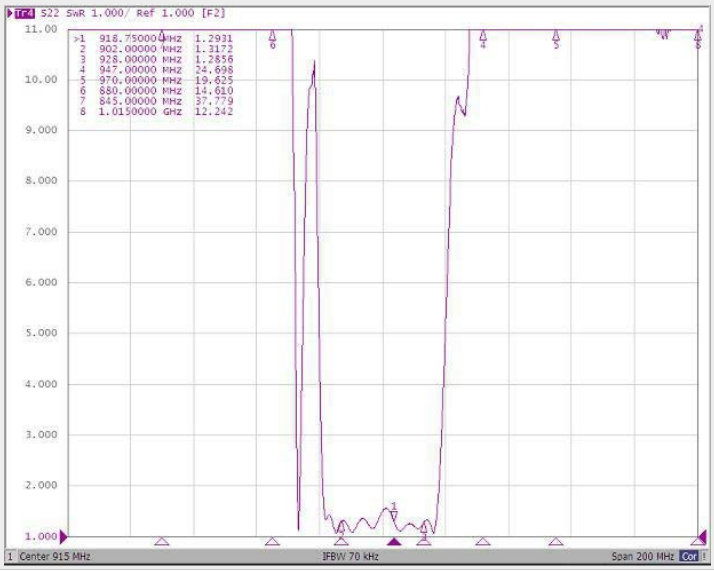
50 Ω / 50 Ω Configuration



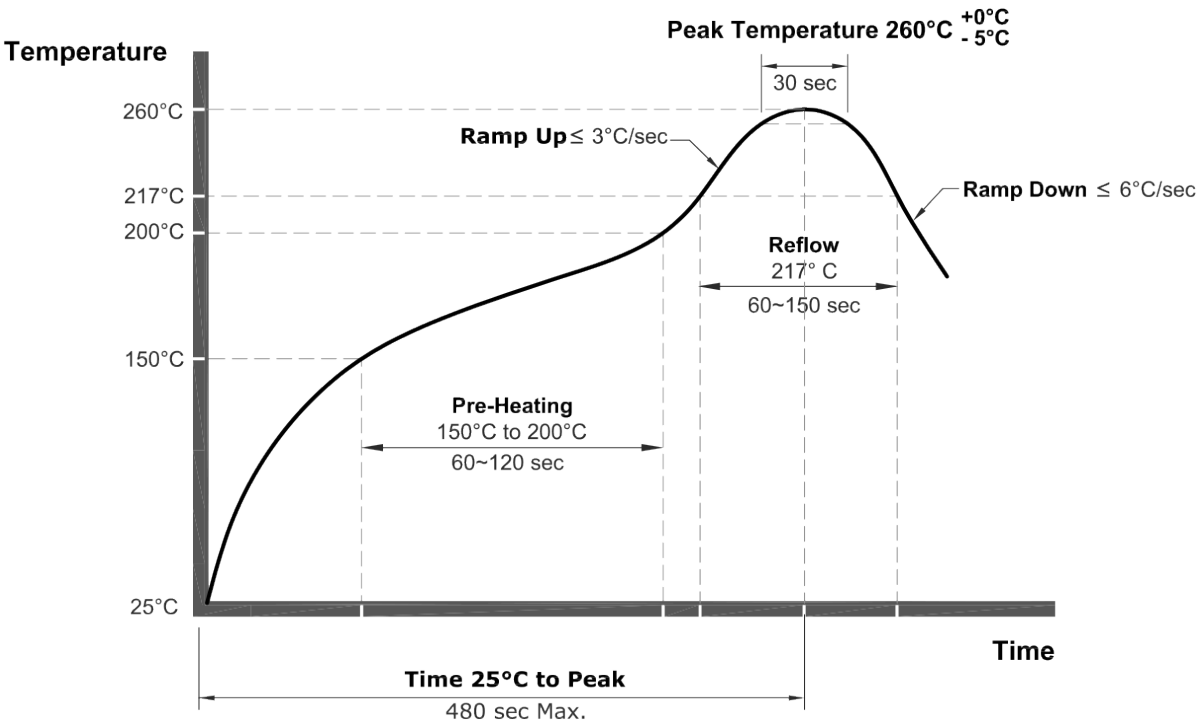
Frequency Characteristics

Parameters	Graphs
Typical S21 response	
S11	

S22



Recommended Reflow Soldering Profile



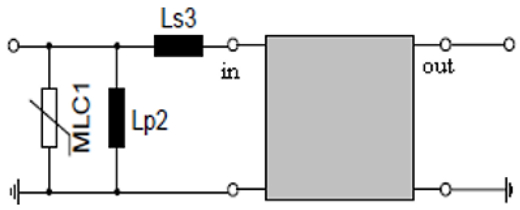
NOTE:

- The components shall remain within the electrical specifications after it soldered on the 1mm thickness PCB board and dipped in the solder at 260 ± 5°C during 10 ± 1 seconds.
- The components shall remain within the electrical specifications after it soldered by electric iron, solder at 350 ± 10 °C during 3~4 seconds. Recovery time: 2 ± 0.5 hour.
- Ultrasonic cleaning may cause deterioration and destruction of the component. Please avoid ultrasonic cleaning.
- Only leads of components may be soldered. Please avoid soldering another part of the component.

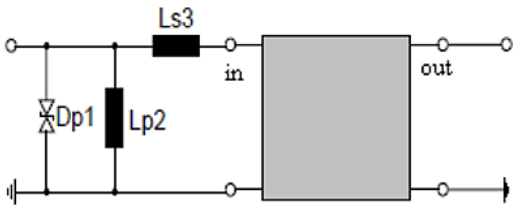
ESD Protection

This product is electrostatic sensitive device. When you install or measure it, you should be careful not to add antistatic electricity or high voltage. Please be advised that you had better check anti serge voltage.

To reduce the probability of damages caused by ESD, the following matching topologies should be applied.



MLC varistor + ESD matching

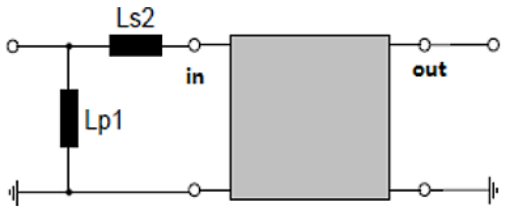


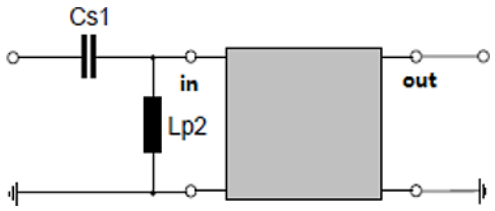
Suppressor diode + ESD matching

ESD matching" should be added to the filter port, where electrostatic discharge is expected. It predominantly appears at the antenna input of RF receivers. Therefore "ESD matching" should be designed to short circuit or block the ESD pulse.

Depending on the input impedance of the SAW filter and the source impedance, the needed component values have to be determined from case to case.

In cases where ESD is minor, the following simplified "ESD matching" topologies can be used:

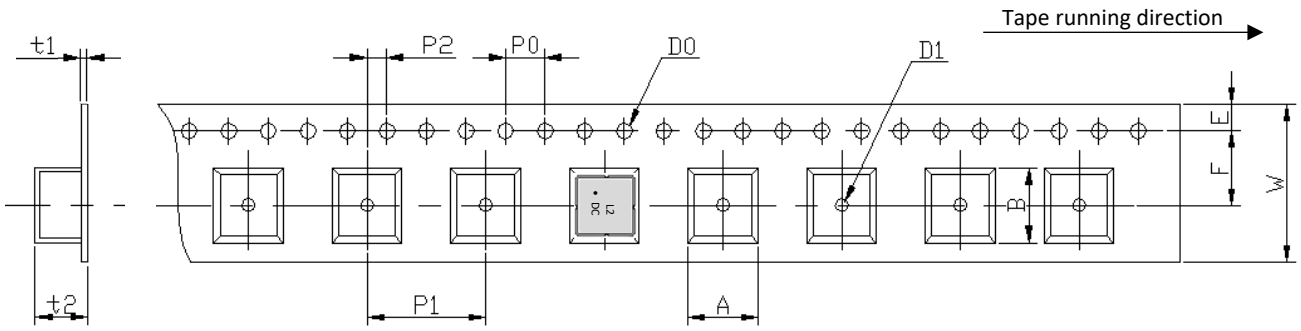




Effectiveness of the applied ESD protection has to be checked according to relevant industry standards or customer specific requirements.

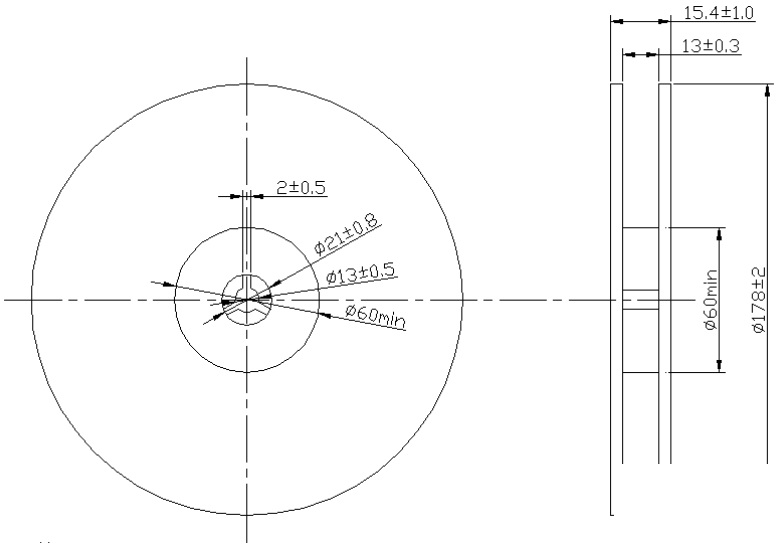
Tape and Reel Specifications

TAPE DETAILS:



Parameter	Code	Dimension	Tolerance
Height of component hole	A	1.4 max	
Width of component hole	B	1.7 max	
Diameter of sprocket hole	D_0	Φ 1.5	± 0.1
Diameter of feed hole	D_1	Φ 0.5	± 0.1
Pitch of sprocket hole	P_0	4.0	± 0.1
Length from hole center to component center	P_1	4.0	± 0.1
Length from Pocket hole center to sprocket hole center	P_2	2.0	± 0.05
Width of carrier tape	W	8	± 0.1
Width of adhesive tape	F	3.5	± 0.05
Gap of hold down tape and carrier tape	E	1.75	± 0.1
Thickness of Ebossed tape sheet	t1	0.25 max	
Thickness of Ebossed tape	t2	1.0 max	

REEL DETAILS:



NOTE:

- Unit: mm
- Standard Packing Quantity (SPQ) is 4000 pieces/ reel
- Each reel is inside an anti-static bag

Reliability Test

Parameter	Test condition / Description	
Mechanical shock	a) Drops: 3 times on concrete floor (b) Height: 1.0 m	
Vibration resistance	(a) Frequency of vibration: 10~55 Hz Amplitude: 1.5 mm	(c) Directions: X, Y and Z (d) Duration: 2 hours
Moisture resistance	(a) Condition: 40 ±2℃, 93+2 -3% RH (b) Duration: 96 hours	(c) Wait 4 hours before measurement
Climatic sequence	(a) +70°C for 16 hours (b) +55°C for 24 hours, 90~9 5% RH (c) -25°C for 2 hours	(d) +40°C for 24 hours, 90~95 % RH (e) Wait 4 hours before measurement
High temperature exposure	(a) Temperature: 85°C (b) Duration: 250 hours	(c) Wait 4 hours before measurement
Temperature cycling	(a) +85°C for 30 minutes ⍰ -40°C for 30 minutes repeated 120 times (b) Wait 4 hours before measurement	
Note	As a result of the particularity of inner structure of SAW products, the components can easily be breakdown by electrostatic shock; so it's mandatory to pay attention to ESD protect during the tests.	